Difference in the Effect of Sedentary Behavior and Fast Food Consumption Habit on BMI (Body Mass Index) among Obese Children

by Desta Ayu

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~~DIFFERENCE IN THE~~ EFFECTS OF SEDENTARY BEHAVIOR AND FAST~~-~~FOOD CONSUMPTION HABIT ON ~~BMI (~~BODY MASS INDEX~~)~~ AMONG OBESE CHILDREN IN SIWALANKERTO VILLAGE, SURABAYA

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ABSTRACT

Obesity ~~(overweight)~~ is the basis of various non~~-~~communicable diseases such as diabetes, hypertension, and cardiovascular disease~~s~~, which are currently ~~still~~ major health problems in Indonesia. ~~In addition~~Furthermore, other consequences that may arise are a greater risk of ~~experiencing bone and joint problems, sleep apnea, and~~ social and psychological problems such as stigmatization and low self-confidence. ~~To prevent these cases~~Hence, ~~the~~ researchers expect to change the pattern of sedentary ~~bb~~behavior~~, namely in the form of behavior~~ and the fast~~-~~food consumption habit among obese children. This research was a quantitative study ~~in the form of Quasi Experiment with two groups pre-test-post-test comparison design.~~ . The~~T~~~~in which~~ treatments were applied towards ~~the sedentary behavior group and the fast food consumption habit group~~two groups, and~~.~~ ~~Furthermore,~~ the conditions before and after treatment were compared. The ~~study~~ results revealed that the mean ~~BMI (~~Body Mass Index~~)~~ (BMI) among children in the sedentary behavior group before and after the intervention were~~as~~ **28.2** (Obesity I)~~,~~ and ~~after intervention it became~~ **19.2** (Normal BMI), respectively. Meanwhile, the mean BMI in the fast~~-~~food consumption habit group before and after the intervention were~~as~~ **28.2** (Obesity I) and ~~after intervention it became~~ ~~19.5~~ **20.5** (normal BMI), respectively. The statistical analysis showed ~~that test obtained a p value of 0.000 (p <0.05). Thus, it can be concluded that statistically there~~a ~~was a~~ significant difference in the decrease in BMI ~~(Body Mass Index)~~ between ~~the sedentary behavior group and fast food habits~~the two group~~s (p<0.05)~~. The sedentary behavior group showed a higher mean value than the fast~~-~~food habit group, namely 20.0 and 19.6, respectively. Thus, it can be concluded that the intervention in the sedentary behavior ~~intervention~~ group was more influential than the fast~~-~~food habit ~~intervention~~ group.

Keywords: Sedentary Behavior; Fast Food Consumption; BMI; Obesity

INTRODUCTION

Health problems that exist in society ~~especially in today's children not only focuses on malnutrition issues, however Now there have been health problems due to overnutrition which creates a double burden at many developing countries and are~~, especially in today's children, focus on malnutrition issues. However, there have been health problems due to overnutrition, which creates

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a double burden in many developing countries. This condition is predicted to be a risk factors for disease progression non-communicable in adult—ons. One of the excess nutrition problems that occur in children—child and get special attention in the world.[1]

Obesity (overweight) is the basis ofbased on various non-communicable diseases such as diabetes, hypertension, and cardiovascular disease, which are currently still major health problems in Indonesia.[21] Obesity occurs due to an imbalance between the amount of energy intake and required by the body for various biological functions, such as development, movement, physical growth, and health maintenance.[32] If this situation continues (positive energy balance) for a long enough time, then esity may occur. Obesity is a state when the body mass index (BMI) of a child is above the 95th percentile on a chi development chart according to gender.[3] In 2008, around 2.8 million adults died from obesity, around . About 300 million people were clinically obese, which is the main contributor to degenerative diseases such as diabetes, heart disease, and cancer. Obesity is a condition of increased levof body fatbody fat level, which is assessed based on the value of body mass index (BMI).[4]

Obese more prone to having prediabetes, a condition in which blood glucose levels indicate a high risk for diabetes. Children and adolescents who are obese at risk are greater foof greater bone problems, sleep apnea, and social and psychological problems like stigmatization and poor self-esteem. While the effect long-term health, namely: children beingare obese from the age of 2 years are more likely to be obese in adulthood and over at risk for such adult health problems heart disease, type 2 diabetes, stroke, some types of cancer, and osteoarthritis. Overweight and obesity in children is also associated with increased risk of various types of cancer, including breast, colon, endometrial cancer, esophagus, kidney, pancreas, gallbladder, thyroid, ovary,are also associated with increased risk of various types of cancer, including breast, colon, endometrial cancer, esophagus, kidney, pancreas, gallbladder, thyroid, and ovary cervix, and prostate, as well as multiple myeloma and Hodgkin's lymphoma.[5]

In Indonesia, the results of Basic Health Research in 2007-2018 showed an increasing trend of obesity, namely 10.5% (2007), % (2013), and 21.8% (2018). Based on Basic Health Research in 2018, the prevalence of obesity in West Java Province was ranked 14th out of 34 Provinces in Indonesia, which increased from 15.2% (2013) to 23% (2018). Considering Oobesity as is an entry point for various Non-Ccommunicable Diseases, and it is necessary to make efforts to prevent and deal with this problem. Prevention of obesity can be performed by balancing the amount of energy intake and output[5] [6].

According to a preliminary study in Siwalankerto Urban Village, Surabaya City, obtained from the results of the posyandu on Rt 5 in February 2020, it was obtained from 32 children who attended posyadu with BMI measurements there were 11 children who11 children were obese 1 in the area. Based on this case, the researcher intends to intervene with obese children who are obese through the provision ofby providing sedentary behavior behavior and fast food consumption habit interventions.

Sedentary behavior behavior is a risk factor for the incidence of obesity among students in Yogyakarta and Bantul, which contributed about 10.95%, with a risk size of 5.15 times for students with a longer sedentary duration. There were differences in activity patterns (duration, type, and frequency) between obese and non-obese students. Regarding the overall difference in activity duration, obese students had a longer duration than non-obese students. The mean difference was 49.81 minutes/day. Based on the type of sedentary behaviorbehavior, obese students had a longer tion for the activities of watching TV, playing games, playing computer, b and card games, and sitwatching TV, playing games, playing computer, board and card games, and sit longer than non-obese students.[6] The results of this study are in line with a study

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conducted by Sherwood et al. ~~which showed that exercise contributed to the prevention of weight gai~~, which showed that exercise contributed to weight gain prevention.~~[7]~~[7]

Fast food is often referred to as ready-to-eat food. Ready-to-eat food is a type of food that is packaged, easy to serve, practical, or processed in a simple way. These kinds of foods are generally produced by the food processing industry with high technology and contain~~ed various additives to preserve and give a taste to~~ various additives to preserve and taste the product. Fast food is usually served in ~~the form of~~ packaged side dishes, instant noodles, nuggets, or corn flakes intended for breakfast.~~[8]~~[8]

According to the results of a study conducted by Fraser et al.~~[,][9]~~[,][9] it was evidenced that adolescents who frequently ate at ~~fast~~ fast-food restaurants~~,~~s consumed more unhealthy foods~~,~~ and tended to have a higher BMI than those who did not periodically ~~e~~te at ~~fast~~ fast-food restaurants.[9] The ~~results of this study~~is study's results are in line with a previous study conducted by Jeffery et al.~~,~~:[10]~~[10]~~ which showed that eating at ~~fast~~ fast-food restaurants (at least once a week) was positively related to a high-fat diet and BMI.[10]

Based on the above background, the researcher is ~~interested~~ prompted to conduct a study entitled "Difference in the Effect of Sedentary Behavior and Fast-Food Consumption Habit on BMI (Body Mass Index) among Obese Children in Siwalankerto Village, Surabaya City."

MATERIAL AND METHODS

This was a quantitative study in the form of a Quasi Experiment with two groups pre-test-post-test comparison design~~[11]~~[11] In this design, treatments were applied towards the sedentary behavior group and the ~~fast~~ fast-food consumption habit group. Furthermore, the conditions before and after treatment were compared~~[12]~~[12] The population in this study was all obese children aged 5-16 years in Siwalankerto Village, Wonocolo District, Surabaya City.

The samples were taken using the total sampling method. Total sampling is a sampling technique where the number of samples is the same as the population.~~[12]~~[12] According to Sugiyono, total sampling can be chosens when the population is less than 100 so that the entire population can be taken as samples.~~[12]~~[12] The incidence of obesity was assessed on an observation sheet using a stature meter and a weighing scale based on general provisions for the use of anthropometric standards to classify BMI.~~[13]~~[13]

~~The method of i~~They were implementing the intervention as a series of ~~b~~behavior (movement behavior) was carried out in the obese group of children, namely doing exercise or movement every morning and evening to see the respondent. Parents are given a checklist in the form of an observation sheet or K~~k~~endari sheet. ~~In order for the respondent to properly carry out these activities.~~ The measuring instrument used to determine Sedentary Behavior is a modified Adolescent Sedentary Activity Questionnaire (ASAQ) Questionnaire Sheet. The method of implementing fast-food food habits intervention. ~~p~~Previously every day, the child was given fast food. The researcher gave the observation sheet to the parents a maximum of one day giving the child ready-to-eat food to see the respondent's compliance. The measuring instrument used to determine fast food habits by measuring BMI (Body Mass Index) is ~~by giving~~given a questionnaire.

In this study, the ~~normality of the data~~data's normality was tested using Shapiro-Wilk since the data was normally distributed. The difference between before and after the sedentary behavior intervention and before and after the ~~fast~~ fast-food consumption habit intervention was tested using the Wilcoxon test, and the comparison between sedentary behavior intervention and fast food consumption habit intervention was tested using Mann Whitney test.~~[14,15,16]~~[14,15,16]

The research was carried out this proposal passed the ~~test Ethical~~Ethical test clearance at SIM-EPK KEPK

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RESULT

Table 1. Characteristics of Respondents in the Intervention Groups of Sedentary Behavior and Fast-Food Consumption Habit

Variable	Group		p value
	Sedentary Behavior (n=12)	Fast-Food Consumption Habit (n=12)	
Age (Years)			**0.584**[1]
Mean (SD)	17.04 (0.767)	16.91 (0.900)	
Median	11	11	
Min ± max	5±16	5±16	
History of Parental Obesity			**0.236**[2]
History of Obesity	8.8 %	3 %	
No History of Obesity	91.2 %	97 %	
Maternal Education Level			**0.238**[2]
Attended School	65.2%	52.2%	
Did Not Attend School	34.8%	47.8%	

Sources: [1]Mann-Whitney Test [2]Chi-Square Test

Based on table 1, ~~it can be seen that the~~the mean age of the respondents in the sedentary behavior intervention group was 11 years, while in the fast-food consumption habit intervention group~~respondents'~~ mean age in the sedentary behavior intervention group was 11 years, while in the fast-food consumption habit intervention group, it was 11 years. Based on the results of the statistical test, it was obtained a ~~p~~ p-value of **0.584.** Thus, it can be concluded that there was no significant difference between the mean age between the two groups (p> 0.05)~~.~~; so that the age factor in this study can be controlled.

Three children (8.8%) in the sedentary behavior intervention group had a history of parental obesity, and 31 children (91.2%) had no history of parental obesity. Furthermore, one child (3%) in the fast-food consumption habit intervention group had a history of parental obesity, and 33 children (97%) had no history of parental obesity. Based on the results of statistical analysis, it was obtained a p-value of **0.236**. Thus, it can be concluded that there was no significant difference between the history of parental obesity in the two groups (p> 0.05).

Based on maternal education level, 65.2% of children in the sedentary behavior intervention group had mothers who attended school, and 34.8% had mothers who did not attend school. Meanwhile, 52.2% of children in the fast-food consumption habit intervention group had mothers who attended school, and 47.8% had mothers who did not attend school. From the results of statistical analysis, it was obtained a p-value of **0.238**. Thus, it can be concluded that there was no significant difference between maternal education in the two groups (p> 0.05).

Based on table 2, it was known that the mean BMI among children in the sedentary behavior group before the intervention was **28.2** (Obesity I). After the intervention, it became **19.2** (Normal BMI). The results of statistical tests found a p-value of 0.000 (p<0.05). Thus, statistically, there was a significant difference between before and after sedentary behavior intervention. It can be concluded that there was a decrease in the mean BMI among children.

Furthermore, the mean BMI in the fast-food consumption habit group before the intervention was **28.2** (Obesity I), and after the intervention, it became **19.5** (normal BMI). The results of statistical tests found a p-value of 0.000 (p<0.05). Thus, statistically, there was a significant difference between before and after fast-food consumption habit intervention. It can be concluded that there was a decrease in the mean BMI among children.

The statistical test obtained a p-value of 0.000 (p <0.05). Thus, it can be concluded that statistically, there was a significant difference in the decrease in BMI between the sedentary behavior and fast food habits groups. The sedentary behavior group showed a higher mean value than the fast-food habit group, namely **20.0** and **19.6**, respectively. Thus, it

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can be concluded that sedentary behavior intervention was more influential than the fast-food habit intervention.

that there was no significant difference between the mean age between the two groups (p> 0.05), so that the age factor in this study can be controlled.

Three3 children (8.8%) in the sedentary behavior intervention group had a history of parental obesity, and 31 children (91.2%) had no history of parental obesity. Furthermore, one1 child (3%) in the fast food consumption habit intervention group had a history of parental obesity and 33 children (97%) had no history of parental obesity. Based on the results of statistical analysis, it was obtained a p value of **0.236**. Thus, it can be concluded that there was no significant difference between the history of parental obesity in the two groups (p> 0.05).

Based on maternal education level, (65.2%) children in the sedentary behavior intervention group had mothers who attended school and (34.8%) children had mothers who did not attend school. (Menawhile, 52.2%) children in the fast food consumption habit intervention group had mothers who attended school and (47.8%) children had mothers who did not attend school. From the results of statistical analysis, it was obtained a p value of **0.238**. Thus, it can be concluded that there was no significant difference between maternal education in the two groups (p> 0.05).

Table 2. Difference in the Decrease in BMI (Body Mass Index) in the Sedentary Behavior Intervention Group and the Fast Food Habit

Sources: [1]Mann-Whitney Test [2]Wilcoxon Test

Based on table 2, it was known that the mean BMI (Body Mass Index) among children in the sedentary behavior group before the intervention was **28.2** (Obesity I), and after the intervention it became **19.2** (Normal BMI). From the results of statistical tests, it was found a p value of 0.000 (p<0.05). Thus, statistically, there was a significant difference between before and after sedentary behavior intervention. It can be concluded that there was a decrease in the mean BMI (Body Mass Index) among children.

Furthermore, the mean BMI in the fast food consumption habit group before the intervention was **28.2** (Obesity I) and after the intervention it became **19.5** (normal BMI). From the results of statistical tests, it was found a p value of 0.000 (p<0.05). Thus, statistically, there was a significant difference

No.	BMI (Body Mass Index)	Group: Sedentary Behavior (n=12)	Group: Fast-Food Consumption Habit (n=12)	p value[1]
1.	Before Intervention [1]			0.211
	a. Mean ± SD	28.2±0.825	28.2±0.689	
	b. Min-max	25.0->40	25.0-40.0	
	c. Median	29.9	29.9	
2.	After Intervention [1]			0.000
	a. Mean ± SD	19.2±0.668	20.5±1.310	
	b. Min-max	18.5-24.9	18.5-25.0	
	c. Median	20.00	24.00	
3	Difference in BMI (Body Mass Index) Before and After Intervention			
	p value[2]	0.000	0.000	-
4.	Difference in Mean[2]			0.000
	a. Mean ± SD	19.6±0.793	20.0±1.313	
	b. Min-max	18.5-22.3	18.5-24.1	
	c. Median	23.5	19.6	

between before and after fast food consumption habit intervention. It can be concluded that there was a decrease in the mean BMI (Body Mass Index) among children.

The statistical test obtained a p value of 0.000 (p <0.05). Thus, it can be concluded that statistically there was a significant difference in the decrease in BMI (Body Mass Index) between the sedentary behavior group and fast food habits groups. The sedentary behavior group showed a higher mean value than the fast food habit group, namely **20.0** and **19.6**, respectively. Thus, it can be concluded that sedentary behavior intervention was more

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~~influential than the fast food habit intervention.~~

DISCUSSION

Table 2. The difference in the Decrease in BMI (Body Mass Index) in the Sedentary Behavior Intervention Group and the Fast Food Habit

~~Sources:~~ [1]Mann-Whitney Test [2]Wilcoxon Test

Sedentar~~i~~y ~~B~~behavior will cause a great cycle, obesity makes sports activities very difficult and less enjoyable, and lack of exercise will indirectly affect the decrease in the person's basal metabolism. Sedentar~~i~~y ~~B~~behavior or exercise is very important in weight loss ~~not only because it burns calories, but also because it~~because it burns calories and helps regulate the normal functioning of the metabolism.

Consumption of fast food / fast food ~~that contains~~containing lots of energy from fat, carbohydrates, and sugar will affect the quality of the diet and increase the risk of obesity. The increase in fast food consumption is believed to be a problem~~, because the problem of~~ because obesity is increasing in people whose families are out looking for fast food and do not have time to prepare food at home. Therefore, ~~with~~ the intervention to manage children's eating patterns for the better is needed to prevent obesity.

This study revealed ~~that there were~~ changes in BMI~~,behavior~~, namely sedentary ~~behavior~~ behavior and eating habits in children before and after being given treatment. This is in line with a study conducted by Khodijah~~,~~ et al.,~~[17](15)~~ which stated ~~that there was~~ a significant relationship between obesity and ~~the quality of life of adolescents~~adolescents' quality of life.[17] The ~~results of such~~ ~~the study~~study results found that the mean quality of life of obese adolescents was lower than adolescents with normal weight. In a study conducted by Kho~~3~~verdi~~,~~ et al.,~~[18](16)~~ ~~it was also stated that~~, there was a relationship between obesity and the quality of life of school~~-~~age children with a ~~p~~-p-value of <0.000.[18] ~~Such~~ The study also explained that the quality of life of obese children was lower than ~~the quality of life of normal children~~normal children's quality of life.

In this study, it was evidenced that there were changes in the ~~Body Mass Index (~~BMI~~)~~ in the two intervention groups, which was previously Obese I then after ~~3~~three months of treatment, it became normal. A study conducted by Khairy~~,~~ et al.,~~[17](19)~~ also stated ~~that there was~~ a significant relationship between obesity and the quality of life of children, where obese children had a lower quality of life than children with normal weight.[19]

Based on a study conducted by Chanand Wang in 2013 through an interview method conducted with one of the children, the child stated that he could not do what other friends at school did~~, h.~~ He could not ride a bicycle or play the piano. The child felt that the other friends did not like making friends with him~~, and has difficulty on~~ and had difficulty getting along with his friends. An interview conducted with one of the teachers also revealed that obese children could not play certain games that could be played by other children.

The most influential change regarding the incidence of obesity experienced by children in Siwalankerto Urban Village, Surabaya City, was found in the sedentary behavior intervention group. Movement behavior is a physical activity that has a major influence on the incidence of obesity compared to fast food consumption habit

CONCLUSION

Based on the results and discussion of this study, it can be concluded that there were changes in BMI ~~(Body Mass Index)~~ before and after treatment in both intervention groups, namely the sedentary behavior group and fast~~-~~food consumption habit group, which was previously ~~Obese I~~ then after ~~3~~three months of treatment, it became normal.

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The most influential change regarding the incidence of obesity experienced by children in Siwalankerto Urban Village, Surabaya City, was found in the sedentary behavior intervention group. Movement behavior is a physical activity that has a major influence on the incidence of obesity compared to fast food consumption habits.

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